

## WASHING BRUSH

### BACKGROUND OF THE INVENTION

#### Field of the Invention

5           The present invention is related to a brush, more specifically a washing brush for washing contaminants off an object.

#### Background of the Related Art

          It is general for a washing brush to comprise a plurality of washing threads fixed to a core. This washing brush is repeatedly moved straight and is rotated to rub the  
10       threads on the article for removing contaminants on the object.

          FIG. 5 and FIG. 6 show a typical example of a conventional washing brush carrying out washing as mentioned above.

          A washing brush 100 as shown in FIG. 5 uses wires 111 as a core 110. A plurality of washing threads 120 made of synthetic resin or natural material are located  
15       between two wires 111, and are fixed between the wires 111 by twisting the wires 111. The fixed threads 120 forms a circular bar shape.

          A washing brush as shown in FIG. 6 uses a circular bar 211 as a core 210. Washing threads 220 are implanted with a constant distance to the circular bar 211 to be fixed thereto, and the fixed threads 220 forms a circular bar shape.

20           In performing washing by straight movement or rotational movement using the above conventional washing brushes, in cases of the washing brush 100, as the core 100 is made of the relatively small wire 111 and can not keep a straight shape constantly, such washing brush 100 is proper for manually washing small objects such as a baby bottle and a glass bottle, but improper for a device such as an automobile washer  
25       automatically washing the object by power of a motor and a cylinder.

          Meanwhile, in case of the washing brush 200, as the circular bar can keep the straight shape constantly, the washing brush 200 can be used for manual washing as well as for a device automatically washing by the power. However, it is often case for such washing brush 200 that the washing tread 220 come out of the circular bar 211.

Additionally, as there are some limitations for fixing threads 100, 200 to the washing brushes 100, 200 to be uniform and dense, high precision washing using the conventional brushes is difficult.

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## SUMMARY OF THE INVENTION

The present invention is contemplated to solve aforementioned problems, and has an object to provide a washing brush in which a core for fixing washing threads can keep a straight shape thereof rigidly and the threads are fixed to the core uniformly, densely, and rigidly, so that it can be properly applied to an automatic washing device and also prevent the threads from being separated from the core.

To accomplish above objects, the present invention provides a washing brush comprising a core having a recess formed at a circumference thereof along an axial direction with a predetermined distance, and a wing formed between the recesses; a plurality of fixing rings surrounding the circumference of the core; washing threads bent at a middle portion thereof, wherein bent portions thereof are caught at each fixing ring and are inserted in the recess; and a fixing means provided to the core and making the rings in close contact with each other.

The threads are caught at the fixing rings and are inserted in the recesses, and a spacer is inserted between the fixing rings so that the threads spread out uniformly.

The fixing means is comprised of a supporter formed at one end in a length direction of the core and projecting outwardly in a radial direction, and a fastening member fastened to the other end in the length direction of the core.

By the present invention mentioned above, as the bent portions of the threads are caught at the fixing ring, are inserted in the recess of the core, and are fixed by the close contact between the adjacent rings, the threads are not separated from the core.

In addition, as the core is made of the iron core excellent in keep the straight shape constantly, the washing brush can be properly applied to the device for automatically washing an object by a power of the motor and the cylinder.

Also, as the threads are uniformly distributed along the circumferential direction

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Also, as the threads are uniformly distributed along the circumferential direction

and are densely disposed due to the close contact between the fixing rings, the washing brush can perform a high precision washing.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5           The features and advantages of the present invention will be more described specifically in the following description of preferred embodiments of the invention with reference to the accompanying drawings wherein:

FIG. 1 is an exploded perspective view showing a washing brush according to the present invention;

10           FIG. 2 is an assembled sectional view showing the washing brush according to the present invention;

FIG. 3 is a sectional view taken along A-A line of FIG. 2;

FIG. 4 is a sectional view showing another embodiment of the present invention; and

15           FIG. 5 and FIG. 6 are a sectional view and a sectional view showing a conventional washing brush.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to an embodiment of the present invention, 20 examples of which are illustrated in the accompanying drawings. In explaining the present invention, the same names and reference numerals will be given to the same components, and explanations in the same will be omitted.

FIG. 1 is an exploded perspective view showing a washing brush according to the present invention, FIG. 2 is an assembled sectional view showing the washing brush 25 according to the present invention, and FIG. 3 is a sectional view taken along A-A line of FIG. 2.

In the present invention, a core 1 is made of an iron core excellent in constantly keep a straight shape thereof.

Recesses 11 of a V-shape are formed at a circumference of the core 1 along an

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Recesses 11 of a V-shape are formed at a circumference of the core 1 along an

axial direction with a predetermined distance, wings 12 are formed between the recesses 11, and a screw 13 is formed along a length direction at a circumference of an outer edge of the wing 13.

5 A plurality of fixing rings 2 for fixing washing threads are disposed surrounding the circumference of the core 1 and the washing threads made of synthetic resin or natural material having a good washing ability are fixed to these fixing rings 2. The fixing ring 2 can make density of the washing threads fixed each ring to be uniform by having a thin thickness.

10 A middle portion of the washing thread 3 is bent, and this bent portion 31 is caught at an inner circumferential surface of each fixing ring 2 and is inserted in the recess 11. A plurality of threads 3 are inserted into each recess 11 with a form of bundle and thus when the fixing rings 2 are closely contacted with each other, the threads 3 spread out in a circumferential direction to be uniformly distributed. In such instance, it is preferable that the threads 3 are caught at the fixing ring 2 and inserted into the recess 11  
15 and a spacer 2a identical with the fixing ring 2 is between the fixing rings 2 so that the threads spread out more uniformly without friction between the threads 3 fixed to adjacent rings 2.

The fixing rings are closely contacted with each other by fixing means 4.

20 The fixing means 4 includes a supporter 41 formed projecting outwardly in a radial direction at one end in a length direction of the core 1 and fastening member 42 fastened to the screw 13 formed at the other end in the length direction of the core 1.

The present invention illustrates an embodiment wherein the supporter 41 is formed conical so as to be a rotational center of the core 1.

25 With a configuration of the fixing means 4 as mentioned above, when the fastening member 42 is fastened to the screw 13 of the core 1, the fixing rings 2 around the core 1 are closely contacted with each other, and the threads 3 coupled to the rings 2 are uniformly distributed and rigidly fixed with spreading out in a circumferential direction.

As shown in FIG. 2, the threads 3 performs washing operation by rotating the

core 1, with the core 1 having a good maintenance of the straight shape being connected to a motor M (or a cylinder) of an automatic washing device, and an end portion of the supporter 41 being coupled into a hole F' of a supporting frame F.

5 In the present invention, as the bent portions 31 of the threads 3 are caught at an inner hole of the fixing ring 2 and are fixed by a close contact between the rings 2 with being inserted in the each recess 11, the threads 3 are not separated from the core 1 during the washing operation.

The present invention mentioned above only explains one preferred embodiment of the preset invention, and does not limit the scope of the present invention. That is, as shown in FIG. 4, the number of recess 11 formed at the core 1 can be increased and the supporter 41 can be formed to be a ring shape appropriate for coupling a bearing thereto, and it is apparent that such modifications are included within the scope of the present invention. In addition, although the above specification describes the washing brush applied to the automatic washing device as one embodiment, this washing brush can be applied to a small manual washing apparatus as well. Also, if the core 1 becomes long, the fastening member 41 is coupled to the core 1 per a predetermined length of the core 1 in order to allow the rings 2 to be properly close-contacted with each other and then to form the brush.

20 The advantages of the washing brush according to the present invention are summarized as follows.

In the present invention, since the bent portions of the threads are caught at the fixing ring, are inserted in the recess of the core, and are fixed by the close contact between the adjacent rings, the threads are not separated from the core. As the core is made of the iron core excellent in keep the straight shape constantly, the washing brush can be properly applied to the device for automatically washing an object by a power of the motor and the cylinder. Additionally, as the threads are uniformly distributed along the circumferential direction and are densely disposed due to the close contact between the fixing rings, the washing brush can perform a high precision washing.

Although a number of embodiment have described in the above specification, it

should be apparent that the present invention could be embodied in many other specific mode included within the sprit and scope of the present invention. Thus, the present embodiments should be considered as illustrative, and the present invention could be modified within the scope of claims and the equivalent thereof.